

19th, Ind. 20th, O. 21st, N. Y. 24th, N. C., Kan., O. 25th, Conn. 26th, Conn., Mich., N. Y. 27th, Conn., Ill., Me., N. H. 28th, Ia., Tex. 29th, Ia., O., Ill., La., Mo. 30th, N. C., Conn., Ill., La., Mich., Miss., N. J., O., Tenn., Tex.

Lunar Halos.—1st, N. M., Neb., Ia., Minn. 2nd, Ia., Wis., Minn., Ill., Conn., Mo., Cal., Neb., Tex., La. 3rd, N. M., Utah, Nebr., Dak., Tex., Fla., Ia., Wis., Minn., O., R. I., Conn., Me., Mass., N. J., N. Y. Cal., Nev., Idaho, La. 4th, Utah, Nebr., Ind. Ty., Wis., Miss., Mo., Nev., Minn. 5th, Ia., Minn., Ill., Ga., Conn., N. Y., Ala., Mass. Mo., N. J., Pa., Idaho, Tex., La. 6th, Kan., Ala., Ill., N. H., Mo., Nebr., N. Y., Tex. 7th, Tex., Fla., Wis., Ill., Tenn., Mass., N. J., La., Minn. 8th, Dak., Tex., Wis., Minn., Ill., R. I., Me., Mass., N. H., N. J., Mich., La. 9th, Tex., Ala., Ia., Minn., Wis., O., Ill., R. I., Conn., Mass., Me., La., Miss., Mo., N. J., Pa. 10th, Tex., N. Y., N. C., N. J., Md., Pa., Va., Conn., Mass., Mich., Mo., O., La. 11th, Dak., Tex., Minn., Wis., N. Y., S. C. Ill., Miss. 12th, N. M., Tex., Ohio, Conn., Mass., Mo., N. J., N. Y., Pa., Cal., Minn. 13th, Ind. Ter., Neb., Ia., Wis., Mo., Neb., N. J., Kan., Tex., La. 14th, Dak., Ia., Mich., Ohio, Va., N. J., Conn., Ill., Kan., Tex. 15th, Va., Me., O., Wis., Cal., Tex. 17th, Dak., Tex. 18th, Neb., Tex. 19th, Ind., Tex., La. 20th, Wis. 21st, Me. 28th, Wis., Tex., La., Minn. 29th, Dak., Tex., Ia., Wis., Ill., Conn., Neb., O., Tenn., Cal., Nev., Minn. 30th, Ia., Mich., Ohio, W. Va., Ind., N. C., Pa., Va., Ill., Ky., Md., Miss., N. J., Va., Wis., Cal., Idaho, Tex., La.

Mirage.—Pembina, Dak., 3rd; New London, 4th, 7th, 8th, 15th, 19th, 27th, 29th; New Bedford, Mass., 10th; Olivet, Dak., 26th.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*Florida*—Houston, 30th, month has been very pleasant and favorable to vegetation, most vines are still growing; sugar cane not yet injured; the manufacture of sugar has continued throughout the month. Milton, since the 15th all winter gardens are doing well. *Iowa*—Tabor, 30th, weather remarkably favorable during the month for harvesting fall crops; corn two-thirds of a crop, but of very good quality and mostly harvested in fine condition. Vail, 30th, farmers still plowing. *Maryland*—Sandy Spring, 30th, clover in bloom second time. *Massachusetts*—Mendon, 30th, grass still green. Somerset, 30th, dandelions and arnica in bloom second time. *Missouri*—Oregon, 25th, farmers still plowing. *Mississippi*—Fayette, 30th, month very favorable for cotton picking; crop all gathered but very light; corn, potatoes and sugar cane very good; hardly a killing frost, some tender plants still alive; sage and morning glories in bloom second time. Brookhaven, 5th, forest leaves falling; witch-hazel, chinese pinks, roses and snap-dragons in bloom second time. *Texas*—Melissa, 14th, early sown fall wheat looking very green, some farmers still sowing; 30th, harvesting of corn and cotton about finished, average yield per acre of corn, about 50 bushels, of cotton about 500 lbs. Clarksville, 30th, very little wheat sown, ground too dry to work, cotton crop nearly all gathered, quality very good but quantity much below expectations. *Pennsylvania*—Chambersburg, 30th, pauties in bloom in the open air. *Virginia*—Broad Oak, 30th, forest leaves all fallen, fall wheat looks well. *Nebraska*—Genoa, farmers plowing during entire month. *New York*—Wappinger's Falls, 21st, farmers still plowing. Palermo, 17th, leaves falling from fruit trees; 10th, grass still green. Flushing, 24th, dandelions in bloom second time. *North Carolina*—Fayettesville, 14th, cherry trees in bloom second time; 30th, fall roses, chrysanthemums and violets in bloom second time, corn crop good, cotton fair, potatoes excellent, fruit average, wheat acreage larger than usual and looks fine. Weldon, 30th, corn crop good, cotton crop small. *Ohio*—Jacksonburg, 26th, wheat and barley luxuriant; 1st to 18th, foliage falling. Ringgold, 30th, wheat and grass still growing.

INSECTS.—*Bees*.—Monticello, Ia., 12th, out in open air. *Moths*.—Oregon, Mo., 5th. *Locusts*.—Denver, no locusts seen during month, and none this year up to date. Fort Sill, Ind. Ty., 1st, diminishing in numbers; 2nd, a few observed going S.; 3rd, gradually decreasing; 12th, almost entirely disappeared. *Crickets*.—Melissa, Tex., 10th. *Native Grasshoppers*.—Melissa, Tex., 29th. *Worms*.—Flushing, N. Y., 28th, appeared on surface of ground. *Small Insects*.—Palermo, N. Y., 16th, myriads flying in the air. *Butterflies*.—Oregon, Mo., 5th. *Katydid*s.—Brookhaven, Miss., 7th.

BIRDS.—*Geese*.—Princeton, Cal., 3d; Mt. Sterling, Ill., 13th; Creswell, Kan., 6th, 10th, flying S.; Ft. Madison, Iowa, 3d, 4th, 10th, 14th; Independence, Kan., 26th, S.; Somerset, Mass., 28th, S.; New Bedford, Mass., 19th, S.; Springfield, Mass., 6th, S.; Waltham, Mass., 19th, S.; Oregon, Mo., 2d, 5th, 16th, 17th; Corning, Mo., abundant during month; no movement yet to the south. Ashley, Mo., 30th; Starkey, N. Y., 28th, S.; Flushing, N. Y., 3d, S.; Bellefontaine, Ohio, 24th; Tioga, Pa., 5th, S.; Cleveland, Ohio, 29th, S.; Cairo, Ill., 7th, 28th, S.; Tybee Island, Ga., 8th, S.; New River, N. C., 11th. *Ducks*.—Daytona, Fla., 1st, flying S. in large flocks; Monticello, Ia., 13th, 26th, S.; Corning, Mo., abundant during month; no movement yet to the south; Starkey, N. Y., 11th; Fayetteville, N. C., 2d, 3d; Jacksonburg, Ohio, 24th, S.; Melissa, Tex., 2d, plenty; Ft. Gibson, Ind. Ty., 24th. *Blackbirds*.—Elmira, Ill., 27th, numerous; Creswell, Kan., 15th, flying S.; Oregon, Mo., 1st to 3d, 7th to 11th, 13th to 15th, 26th; Wappingers Falls, N. Y., 2d, flying S. *Wild Pigeons*.—Fayetteville, N. C., 2d, 3d. *Snowbirds*.—Creswell, Kan., 25th. *Yellowbirds*.—Ringgold, Ohio, during month. *Jaybirds*.—Oregon, Mo., 10th; Palermo, N. Y., 11th. *Owl*.—Oregon, Mo., 2d, 12th, 22d, 23d. *Meadow Larks*.—Creswell, Kan., 27th. *Prairie Chickens*.—Creswell, Kan., 28th, plenty. *Buffalo Birds*.—Creswell, Kan., 4th, leaving. *Quails*.—Oregon, Mo., 1st. *Crows*.—Creswell, Kan., 24th, 26th; Oregon, Mo., 22d; Bellefontaine, Ohio, 3d, flying S. *Cranes*.—Oregon, Mo., 27th; Fayette, Miss., 1st, 4th, 21st, 27th, flying S.; Melissa, Tex., 1st, S. *Bluebirds*.—Waltham, Mass., 4th, disappeared; Oregon, Mo., 1st, 17th; Starkey, N. Y., 13th, flying S.; Ringgold, Ohio, during month. *Robins*.—Daytona, Fla., 26th, first seen this season; Fayette, Miss., 9th, first heard; Brookhaven, Miss., 6th; Starkey, N. Y., 3d, flying S.; Melissa, Tex., 8th, first appearance. *Eagles*.—Wappingers Falls, N. Y., 23d.

Meteors.—Vevay, Ind., 12th to 14th. New Corydon, Ind., 2d, 14th, 23d, 26th, 28th to 30th. Fort Dodge, 16th, 8:15 p. m., very brilliant meteor of intense yellow color, exploded with a dazzling flash, but no noise; size twice or thrice that of Jupiter; after explosion a streak of greenish light remained visible for a second or two. Topeka, Kan., 17th, 7 p. m., brilliant meteor moved from near the zenith towards the southwest through a path of about 20°; size about twice that of Jupiter; color, orange red; 27th. Afton, Ia., 1st, 7th, 27th. Vail, Ia., 14th. Holton, Kan., 18th. Woodstock, Md., 15th, 8:35 p. m., meteor appeared in the west at a height of about 45° and traveled very slowly over an arc of about 30°; it was brighter than Jupiter; color, orange tinged with red on lower side; exploded into three parts, the largest the size of Jupiter; 1st to 4th, 12th, 13th, 23d, 24th, 29th, 30th. Owing's Mills, Md., 2d. Fall River, Mass., 6th, 26th. Rowe, Mass., 24th, 26th, 29th. Fayette, Miss., 3d, 4th, 6th, 19th, 21st, 23d. Oregon, Mo., 1st, 18th, 22d, 23d. Kansas City, Mo., 12th, 13th. Norfolk, Neb., 14th. Freehold, N. J., 14th. Atco, N. J., 5th, 15th. Linden, N. J., 29th. Jersey City, N. J., 24th. Waterburg, N. Y., 24th, 27th, 30th. Stankey, N. Y., 23d. Wappinger's Falls, N. Y., 1st, 13th, 24th, 26th, 29th. Flushing, N. Y., 24th. Jacksonburg, Ohio, 18th. Cleveland, Ohio, 23d. Strafford, Vt., 15th. Broad Oak, Va., 29th. Davenport, Iowa, 18th. Indianapolis, Ind., 2d. New Haven, Conn., 13th. Sacramento, Cal., 22d. Pioche, Nev., 29th, 30th. Boise City, Idaho, 23d, 26th, 27th. Breckenridge, 14th. Princeton, Cal., 10th, 8:30 p. m., meteor equal in size to Jupiter; appeared in the west at a height of 45°; 22d, 8 p. m., meteor, size, one-eighth of full moon; appeared in the north northwest of a height of about 35° and moved to the west 60°, where it exploded; trail visible for three minutes, nearly as bright as day. South Hartford, N. Y., 1st, 5th. Cambridge, Mass., 14th, a brilliant meteor was observed to fall to the ground during broad sunshine, apparently at a distance of about ten rods from position of observer; the ground was examined, but nothing found resembling a meteoric stone. Brilliant meteors were also observed in Iowa; at Albion, on the 14th; Anita and Albion, 15th; Waverly, 16th, Decorah, 20th, and at Council Bluffs and Charles City on the 28th. Mr. E. F. Sawyer, of Boston, reports none on 23rd, 24th, 26th, 29th; cloudy on 25th, 27th, 28th, 30th; Bielas comet or meteor shower was expected on the 27th.

Polar Bands.—Bismarek, Dak., 16th; Savannah, 11th, 24th; New Corydon, Ind., 3rd, 10th, 14th, 15th, 19th, 29th; Tabor, Ia., 13th, 20th, 28th, 29th; Gardiner, Me., 3rd, 7th, 16th; Danville, Ky., 30th; Fayette, Miss., 2nd; Plattsmouth, Neb., 2nd, 20th; Auburn, N. H., 30th; Freehold, N. J., 9th; Vineland, N. J., 20th; Woodstock, Vt., 2nd, 16th; Wytheville, Va., 5th, 10th, 14th.

Zodiacal Light.—Savannah, 13th, 14th, 22nd; Southington, Conn., 14th; New Corydon, Ind., 1st, 2nd to 5th, 23rd, 24th, 29th, 30th; Monticello, Ia., 25th; Somerset, Mass., 14th; Oregon, Mo., 1st, 20th, 23rd; Contoocookville, N. H., 30th; Waterburg, N. Y., 2nd, 27th, in the morning; Cambridge, Mass., regularly looked for at 8 p. m., suspected on the 14th and 23rd, seen distinctly on the 24th and 26th: these four were the only evenings when the observation was not hindered by clouds or moonlight.

Prairie Fires.—Fort Gibson, Ind. Ter., 1st to 9th, 11th to 13th, (14th, many buildings and miles of fences burning,) 15th, (17th, nearly all fences burned in vicinity of National cemetery,) 23rd to 25th, 28th, 29th; Dodge City, Kan., 1st, 2nd, 20th, 29th, 30th; Pembina, Dak., 14th; Creswell, Kan., 1st to 7th, 12th, 16th to 25th, 29th; Independence, Kan., 3rd, 22nd to 24th, 28th; Topeka, Kan., nearly every night during month; Monticello, Ia., 30th; De Soto, Neb., nearly every day; Oregon, Mo., 13th, 18th, 22nd, 23rd.

Earthquakes.—Medellin, United States of Colombia, S. A., September 9th, 7:00 p. m., "single shock; no damage at this place, but at Manizales, 80 miles south of Medellin, several houses were destroyed;" 10th, 12:30 p. m., slight shock. Manizales, Antioquia, United States of Colombia, S. A., October 9th, (probably September 9th,) severe earthquake, 110 houses destroyed, including church, hospital and principal city buildings; no lives lost, as shock was long sustained, with principal force, at its termination. October 8th, Yokohama, Japan, 10:48 p. m., slight shock; 9th, 1:20 p. m., smart shock, duration 45 seconds. San Jose, California, 11th, 7:30 p. m., severe shock, accompanied by a rumbling noise; vibrations from N. and S., lasting 30 seconds. November—San Francisco, 11th, 9:45 a. m., slight shock, with undulations, from east to west, and lasting about two seconds. Cairo, Ills., 18th, at 11h. 51' 50", "a trembling motion was felt, lasting 40 seconds, followed by a rocking motion from WNW. to ESE., lasting 20 seconds, and a second trembling lasting 10 seconds,"—houses distinctly felt to totter, and loose bricks were shaken from chimneys. Leavenworth, 18th, 11:15 p. m., slight shock, movement hardly sufficient to determine the direction, but it seemed to be from north to south. St. Louis, 18th, 11:57 p. m., slight shock, movement north to south, lasting but a few minutes and was felt only by persons occupying quiet positions in old buildings and in a few brick buildings, persons in the streets did not perceive the shock. Lebanon, Mo., 18th, a few minutes after midnight a severe shock, large brick houses trembling, awakening persons sleeping on second floor; vibration north to south, continuing for eight or ten seconds, and followed by two lesser shocks, with six or eight seconds intervening; noise a low rumbling like distant thunder. Cairo, Ill., 19th, 5:10 a. m., slight trembling, lasting 20 seconds, houses tottered from WNW to ESE. Murphy, N. C., 23rd, 10 a. m., slight shock from west to east, lasting one minute, not much jar, but a rumbling noise like distant thunder. Panama, Nov. 7th, advices from San Salvador, C. A., report the volcanoes Izalco and Santa Ana in a state of great activity, and confirm the previous report of a severe earthquake in southern portion of the republic, resulting in great loss of life and property.

Sea Fog Wave.—The observer at New Westminster, B. C., reports the annual sea fog wave, (which he considers as the beginning of winter) to have made its first appearance this year on October 31st, at 4 p. m., barometer 30.04, temperature 49°; its first appearance occurred as follows, during the preceding five years:

Year	Month.	Hour.	Barometer.	Temperature.
1873.	October 27.	4:00 P. M.	30.23.	46°
1874.	" 31.	5:00 P. M.	30.14.	49°
1875.	" 9.	9:30 P. M.	29.93.	49°
1876.	" 9.	4:30 P. M.	30.00.	65°
1877.	" 19.	8:00 P. M.	29.86.	47°

Sunsets.—The characteristics of the sky at sunset, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from 123 stations show 3,682 observations to have been made, of which 37 were reported doubtful; of the remainder 3,140 or 85.3 per cent. were followed by the expected weather.

Sun Spots.—Monthly record of observations by Mr. D. P. Todd, Nautical Almanac office, Washington, D. C., communicated by Prof. S. Newcomb, U. S. Navy, in charge of that office:

Nov., 1878.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
1st, 4 p. m...	0	0	0	0	0	0	1	1	
2nd, 4 p. m...	0	1	0	0	0	0	1	2	
4th, 3 p. m...	0	0	0	0	0	0	1	1	
5th, 3 p. m...	0	0	0	0	0	0	1	1	
7th, 4 p. m...	0	0	0	0	0	0	1	1	
8th, 4 p. m...	0	0	0	0	0	0	1	1	
9th, 4 p. m...	0	0	0	0	0	0	0	0	
12th, 4 p. m...	0	0	0	0	0	0	0	0	
13th, 4 p. m...	0	0	0	0	0	0	0	0	
14th, 3 p. m...	0	0	0	0	0	0	0	0	
16th, 3 p. m...	0	0	0	0	0	0	0	0	
16th, 2 p. m...	0	0	0	0	0	0	0	0	
20th, 1 p. m...	1	2	0	0	1	2	1	2	Faculae.
23rd, 4 p. m...	0	0	0	0	0	0	0	0	
26th, 2 p. m...	0	0	0	0	0	0	0	0	
29th, 3 p. m...	0	0	0	0	0	0	0	0	
30th, 2 p. m...	0	0	0	0	0	0	0	0	

Mr. John W. James, at Riley, Ill., reports that up to the 28th the sun spot, observed on the 3rd, had not reappeared. Prof. Gustavus Hinrichs, at Iowa City, Iowa, one very large spot observed from the 1st to the 8th. Mr. Jay Harcourt, at Wappinger's Falls, N. Y., observed one spot, on the 3rd, near the sun's centre, slightly below equator, very round and sharply defined; 4th, same spot, slowly rotating, changing its form to the shape of a kidney; 5th, slowly rotating towards the sun's circumference, 21st, 24th and 26th sun examined, but no spots. Mr. David Trowbridge, at Waterburg, N. Y., examined the sun on the 1st, 2nd, 3rd, 4th, 5th, 9th, 10th, 12th, 14th, 15th, 16th, 24th, 29th and 30th; spots observed from the 1st to 5th, disappearing on the 9th. Mr. H. D. Govey, of North Lewisburg, Ohio, observed spots on the 2nd, 4th and 6th, disappearing on the 12th by solar rotation; 26th, observed spot which might have appeared by solar rotation.

NOTES AND EXTRACTS.

Altitude of Meteors.—In the *Wochenschrift*, page 304, Torvald Köhl gives the altitude of twelve meteors simultaneously observed at two neighboring stations. Four hundred and eighteen meteors were observed in all, but only for these twelve could altitudes be computed; the results are obtained by Brandes' graphic method, and are as follows:

ALTITUDE IN GEOGRAPHICAL MILES.

No.	AT THE BEGINNING.	AT THE END.	No.	AT THE BEGINNING.	AT THE END.
1	10	11.6	7	—	14.0
2	16	12.3	8	—	5.0
3	—	9.3	9	16	—
4	—	10.9	10	11	7.0
5	—	18.0	11	11.5	10.0
6	—	13.6	12	15.25	18.5

Photographing the Clouds.—In a letter to the European Meteorological Congress, (*Wochenschrift*, p. 327,) Dr. Hildebrandsson urges universal attention to the motions of the upper and lower clouds, and adds: "The various forms of the clouds are, without doubt, of great interest, and their earnest study will certainly lead to important discoveries. But we must photograph the various forms of the clouds on a large scale, at different points in Europe, and note the different atmospheric conditions under which they occur. The studies executed in Upsala, with the assistance of an experienced photographer, have convinced us that these pictures can be taken in the majority of cases, even when the apparent motion of the clouds is very considerable. But it is, then, imperative to use extraordinarily sensitive plates, so that the time of exposure may last only a portion of a second. This is also the case when one would obtain good pictures of the small transparent cirrus clouds, whose photographic effect is but little different from that of the blue light of the sky. In this way we have, at Upsala, obtained an interesting series of photographs, which show how one form of cloud gradually passes over into another form." The Observers of the Signal Service have, since Nov. 1, 1870, made three daily simultaneous observations and reports of the direction of the winds and of the directions of movement of upper clouds at the different stations throughout the United States for purposes of study. In 1871 photographs of clouds were taken by the photographer employed at this office in connection with the meteorological instruments. In May, 1872, Assistant Cleveland Abbe,